IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

		Attorney Docket No. **AUS920040024US1**
In re Application of: **FREEMAN LEIGH RAWSON III**	§ §	
	§	Examiner: **MARDOCHEE CHERY**
Serial No.: **10/825,143**	§	Confirmation No.: **7823**
Filed: **APRIL 15, 2004**	§	Art Unit: **2188**
For: **SYSTEM AND METHOD FOR RECLAIMING ALLOCATED MEMORY TO REDUCE POWER IN A DATA PROCESSING SYSTEM**	§	

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is filed pursuant to Appellant's Notice of Appeal filed December 12, 2008.

Real Party in Interest

The real party in interest is assignee International Business Machines Corporation, Armonk, New York.

Related Appeals and Interferences

Appellant is aware of no appeals or interferences that would be affected by the present appeal.

Status of Claims

Appellant appeals the final rejection of claims 1 and 21-27. Claims 2-20 have been canceled. The claims on appeal are listed in the attached Claims Appendix.

Status of Amendments

There are no pending amendments in this application.

Summary of the Claimed Subject Matter

The claims are directed to a method of managing power in a virtual machine data processing system by monitoring a system parameter indicative of power consumption. Responsive to determining that the parameter differs from specified thresholds, a system guest, such as an operating system image, may be forced to release a portion of its allocated system memory. The portion of system memory released by the guest is then reclaimed by the system. The reclaimed system memory and the resulting decrease in allocated memory may enable the system to reduce system memory power consumption. In some embodiments, the guest operating system de-allocates a portion of system memory when a balloon code device driver executing under the guest operating system requests the guest operating system to allocate memory to it. The system memory allocated to the balloon device driver may then be reclaimed by supervisory code, such as a Hypervisor, running on the host data processing system.

Referring to the drawings, and specifically to Figure 2, a virtualized machine embodiment includes a data processing system that includes a plurality of guest operating system images 204-1 – 204-2, a Hypervisor 202 to manage memory allocation among the operating system images, and monitoring facilities to determine that system memory power consumption differs from a desired level. (Page 6, lines 6-8). Each guest operating system image 204-1 – 204-2 includes a balloon device driver 210-1 – 210-2. (Page 6, lines 8-17). When system memory power reduction is indicated, a memory controller 220 invokes a balloon device driver 210-1 – 210-2 to consume memory allocated to a guest operating system image 204-1 – 204-2. (Page 6, lines 25-28). Hypervisor 202 may then reclaim memory consumed by balloon device driver 210-1 – 210-2. (Page 6, lines 28-30).

Referring to Figure 4, embodiments of the claimed method of the present invention monitor an indicator of system memory power consumption, such as temperature, at block 403. (Page 9, lines 13-15). When the method detects a first threshold or emergency condition, at decision block 404, the method undertakes unconditional action to reduce memory consumption. (Page, 9, lines 15-17). An example of an emergency condition is an operating temperature above which continued operation is not warranted by the system's manufacturer. (Page 9, lines 16-17). The method identifies a system memory consumption goal, at block 407. (Page 10, lines 10-11).

Then, the method selects a first guest, at block 408, and identifies a memory consumption goal for the selected guest, at block 410. (Page 11, lines 3-5) The method invokes the memory consumer, which is a balloon device driver, associated with the selected guest, at block 412, to consume some of the memory allocated to the selected guest. (Page 12, lines 16-18). Then, the method reclaims the memory pages consumed by balloon device driver of the selected guest, at block 414. (Page 12, lines 18-24). The method then compacts the reclaimed pages and powers down unused memory sections, at block 416. (Page 13, lines 3-12). If, as determined at decision block 418, there are more guests, the method returns to block 410. If not, the method returns to block 403 to continue to monitor system power consumption.

Returning to decision block 404, if the first threshold or emergency condition does not exist, the method determines, at decision block 405, if there is a second threshold or warning condition. (Page 9, lines 22-24). A warning condition is temperature less than the emergency condition temperature that may warrant reducing memory usage. (Page 8, lines 22-23). If so, the method determines, at decision block 406, if the system is under memory pressure. (Page 9, lines 24-28). If not, the method executes the steps of blocks 407-420 to reduce memory usage. (Page 10, lines 1-2). If, as determined at decision block 406, the system is under memory pressure, the method returns to block 403 to continue monitoring system power consumption, without reducing memory usage. (Page 9, line 28 – page 10, line 1).

Returning to decision block 405, if the second threshold or warning condition does not exist, the method determines, at decision block 504, if system performance is acceptable. (Page 13, lines 21-23). If so, the method returns to block 403 to continue to monitor system power consumption. (Page 13, lines 23-25) If, as determined at decision block 504, system performance is not acceptable, the method returns memory to the guests. (Page 13, lines 25-27). The method identifies a system memory release goal, at block 506, (Page 13, lines 27-28), and selects a first guest a block 508. (Page 13, line 28). The method identifies a memory release goal for the selected guest, at block 510. (Page 13, line 29). The method executes the balloon device driver for the selected guest to release consumed memory back to the selected guest, at block 512, thereby returning pages to the selected guest, as indicated at block 514. (Page 13, line 31 – page 14, line 2). If, as determined at decision block 516, there are more guests, the method selects a next guest, at block 518, and returns to block 510. If there are no more guests, the method returns to block 403 to continue monitoring system power consumption. (Page 14, lines 2-4).

Grounds of Rejection to be Review on Appeal

Claims 1 and 21-26 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement and for reciting new matter.

Claims 1 and 21-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh, et al., U.S. Patent Application Publication No. 2004/0260957 (Jeddeloh), in view of Waldspurger, *Memory Resource Management in VMware ESX Server* (Waldspurger).

Claim 1 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rawson, III, U.S. Patent Application Publication No. 2004/0111596 (Rawson, III '596), in view of Waldspurger.

Argument

I. Claims 1 and 21-26 are Patentable under 35 U.S.C. §112, First Paragraph

Claims 1 and 21-26 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement and for reciting new matter. The Examiner asserts that the recitation of claim 1 "responsive to determining that the parameter is greater than a specified first parameter" is not supported by the original disclosure. The Examiner cited the following two portions of the specification as not supporting the subject matter of claims 1 and 21-26:

> "If emergency conditions are indicated (e.g., a system temperature above a critical value), memory consumption activity is undertaken unconditionally (i.e., regardless of system performance levels)." (Page 9, lines 15-18).
>
> "each guest's quota reflects the size of each guest (the amount of memory currently occupied by the guest) as well as the amount of activity attributable to the operating system, where relatively large and idle operating systems have higher quotas than relatively small and active operating systems." (Page 12, lines 4-7).

While the Appellant respectfully submits that the first cited portion of specification, particularly when read with the rest of the specification, does indeed support the subject matter of claims 1 and 21-26, the Appellant respectfully submits the Examiner has ignored the remainder of the specification, which describes and provides ample support for the subject matter of claims 1 and 21-26.

The SUMMARY OF THE INVENTION of the present application states in part as follows:

> "[W]hen the code detects a variance between *an emergency value* and the monitored indicator, the code then consumes system memory regardless of the value of other system performance parameters. If the code detects a variance between *a second value (e.g., a warning value)* and the monitored indicator, the code may consume system memory depending upon the value of system performance parameters (i.e., if performance is currently above a minimum acceptable value)." (Emphasis added). (Page 3, lines 2-7).

Original claim 1 recited "responsive to determining that the parameter differs from a specified threshold...." In response to a first office action, the Appellant amended claim 1 to recite "responsive to determining that the parameter ~~differs from~~ is greater than a specified first threshold...." The Appellant modified the threshold recited in original claim 1 to distinguish the first threshold from a second threshold recited in new claims 24-27.

Referring to the specification and drawings, Figure 4 is a flow diagram depicting a method 400 of using a memory consumer to conserve energy used by and reduce the operating temperature of a data processing system. (Page 8, lines 3-5). Method 400 includes an initialization process, at block 402, in which goals are set for selected operating parameters of the data processing system. (Page 8, lines 5-7). The operating parameters for which goals are set include the energy and power consumed by the system and the operating temperature of the system. (Page 8, lines 7-9). The operating goals established in block 402 may include a first set of goals that indicate "emergency" conditions and a second set of goals that may be characterized as "warning" conditions. (Page 8, lines 10-12). The emergency conditions indicate limits of operating parameters beyond which continued operation represents a threat to the integrity of the system and/or the system's operation. (Page 8, lines 12-14). The warning conditions indicate less dire conditions that may be used to initiate corrective action assuming that other system objectives are being met. (Page 8, lines 14-15). An example of an emergency condition is an operating temperature above which continued operation is not warranted by the system's manufacturer. (Page 8, lines 16-17). If the system temperature exceeds the warning temperature (but is less than the emergency temperature), memory-consuming activity may occur if other conditions, such as system performance or latency, are within a desired range. (Page 8, lines 21-23).

The term threshold was recited in the original claims and the SUMMARY OF THE INVENTION. (See e.g. Page 1, line 31). The specification, as filed, discloses two operating

parameter thresholds. The emergency condition represents a first threshold and the warning condition represents a second threshold. In the language of the claims, "a system parameter indicative of power consumption" finds support in temperature. "A specified first threshold" finds support in an emergency condition or temperature. "A specified second threshold" finds support in a warning condition or temperature. The present claims are encompassed by the SUMMARY OF THE INVENTION, as filed. The Appellant respectfully submits that claims are allowable under 35 U.S.C. §112, first paragraph, and that no new matter has been introduced into the application. The Appellant respectfully requests that the Examiner's rejection be reversed.

II. Claims 1 and 21-27 are Patentable over Jeddeloh in view of Waldspurger

A. Introduction to Obviousness

A determination under §103 that an invention would have been obvious to someone of ordinary skill in the art at the time the invention was made is a conclusion of law base on fact. *Panduit Corp v. Dennison Mfg. Co.* 810 F.2d 1593 (Fed. Cir. 1987). After the involved facts are determined, the decision maker must then make a legal determination of whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time when the invention was unknown, and just before it was made. *Id.* at 1596. The United States Patent and Trademark Office has the initial burden under §103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071 (Fed Cir. 1988). To establish a *prima facie* case of obviousness, the prior art references applied by the Examiner, when combined, must teach or suggest all the recitations of the claims. M.P.E.P. §2143.

The Appellant respectfully submits that the pending claims are patentable over the cited references for at least the reason that neither the cited references nor any combination thereof disclose or suggest each of the recitations of the claims. The patentability of the pending claims is discussed in detail hereinafter.

B. Independent Claim 1 is Patentable over Jeddeloh in view of Waldspurger

Independent claims 1 and claims 21-27, which depend from claim 1, stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh, et al., U.S. Patent Application Publication No. 2004/0260957 (Jeddeloh), in view of Waldspurger, *Memory Resource Management in VMware ESX Server* (Waldspurger). On the one hand, the Examiner asserts that "Jeddeloh discloses a method of managing power in a data processing system [par. 0024]; comprising: monitoring a system parameter indicative of power consumption [par. 0029];

responsive to determining that the system parameter [is] greater than a specified threshold [par. 0029], reducing system memory power consumption [par. 0035]." On the other hand, the Examiner asserts that "Jeddeloh does not explicitly disclose determining that the parameter is greater than a specified threshold." It should be kept in mind that "the parameter" is a parameter indicative of power consumption.

Jeddeloh discloses a memory module 300 that includes a memory hub 312. Memory hub 312 monitors memory utilization and directs memory devices 104 of memory module 300 to enter a reduced power state when the module is being used at less than a desired level. Memory module 300 includes an activity monitor 350, a power management controller 360, and a temperature sensor 370. Power management controller 360 monitors signals received from activity monitor 350 and temperature sensor 370 to determine whether the memory module 300 is active. If memory module 300 is active, it is maintained at fully operational status. However, if memory module 300 is not active, power management controller 360 can direct the memory module 300 to assume a reduced power consumption state. Activity monitor 350 monitors memory commands to memory module 300, to determine directly whether the system is using the memory module. Temperature sensor 370 monitors the temperature of the memory devices 104 to determine indirectly whether the system is using memory devices 104. Memory devices 104 actually being used consume more power and radiate more heat than memory devices 104 not being actively used. (Jeddeloh paragraph [0023]). Power management controller 360, acting on input from the activity monitor 350 or the temperature sensor 370, can direct the memory module 300 into a reduced power mode when the memory module is inactive, i.e., when activity monitor 350 determines a memory access activity level below an activity threshold or temperature sensor 370 determines a temperature level below a temperature threshold. (Jeddeloh paragraph [0023]).

The operation of Jeddeloh is described with reference to Fig. 4. Memory module 300 is maintained at full operational power at block 404. Activity monitor 350 monitors system requests at block 408. Temperature sensor 370 monitors device temperature at block 412. If, as determined at decision block 416, a module idle threshold, which is a memory access activity level less than a predetermined level, is reached, memory module 300 enters a power reduction mode at block 420. If, as determined at decision block 424, a module idle temperature threshold, which is a temperature less than a predetermined temperature, is reached, memory module 300 enters the power reduction mode at block 420. As long as memory access activity level remains

above the idle threshold and device temperature remains above the idle temperature, memory module 300 is maintained at full operational power. If module 300 is in power reduction mode and module 300 receives a memory command, as determined at decision block 428, memory module 300 returns to full operational power at block 404.

The Appellant respectfully submits that the Examiner's assertion that Jeddeloh discloses reducing system power consumption in response to determining that a system parameter indicative of power consumption is greater than a specified threshold is erroneous. All Jeddeloh discloses is entering a memory module power reduction mode if memory activity level or memory device temperature is too low. There is no disclosure in Jeddeloh of de-allocating a portion of system memory if a system parameter indicative of power consumption, is too high, as claimed. The Appellant respectfully submits that a reference cannot be said to suggest an invention if the reference discloses doing the opposite of what is claimed.

The Examiner asserts that "Waldspurger discloses determining that *the parameter* is greater than a specified threshold [sections 6.1 to 6.3]." (Emphasis added). It will be recalled that "the parameter" of the claims is a parameter indicative of power consumption.

Waldspurger discloses a "VMware ESX Server" (ESX Server), which is a software layer designed to multiplex hardware resources efficiently among virtual machines (VMs), also called guests, running unmodified commodity operating systems. A ballooning technique reclaims memory pages considered least valuable by the operating system running in a virtual machine. An idle memory tax achieves efficient memory utilization while maintaining performance isolation guarantees. (Waldspurger, Abstract).

The ESX Server supports over-commitment of memory, which means the total size of memory configured for running VMs exceeds the total amount of actual machine memory. The ESX Server manages the allocation of memory to the VMs automatically based on configuration parameters and system load. Each VM has the illusion of having a fixed amount of physical memory. A configuration parameter, *max size*, represents the maximum amount of actual machine memory that can be allocated to a particular VM. (Waldspurger, Section 3).

When memory is over-committed, the ESX Server uses "ballooning" to reclaim space from one or more virtual machines. A "balloon module" is loaded into each guest operating system as a pseudo-device driver or kernel service. The balloon driver has no external interface

with the guest. The balloon driver communicates with the ESX Server via a private channel. The ESX Server reclaims memory from a VM by instructing the VM's balloon driver to "inflate" by allocating pinned pages within the VM using native interfaces. The server may allocate memory back to the VM by instructing the VM's balloon driver to deflate. (Waldspurger, Sections 3.1 and 3.2).

Three basic parameters control the allocation of memory to each VM. In addition to the *max size* parameter described above, a *min size* parameter guarantees a lower bound on the amount of memory allocated to the VM even when memory is over-committed. A memory *shares* parameter entitles a VM to a fraction of physical memory based a proportional-share allocation policy. (Waldspurger, Section 6.1). The ESX Server recomputes memory allocations dynamically in response to various events, including changes to system-wide or per-VM allocation parameters by a system administrator, the addition or removal of a VM from the system, and changes in the amount of free memory that cross predefined thresholds. Additional rebalancing may be performed periodically to reflect changes in idle memory estimates for each VM. (Waldspurger, Section 6.3).

The ESX Server uses four thresholds to reflect different memory reclamation states. In a *high* state, free memory is sufficient and no reclamation is performed. In a *soft* state, the system reclaims memory using ballooning, and resorts to paging only in cases where ballooning is not possible. In a *hard* state, the system relies on paging to reclaim memory forcibly. Finally, if free memory falls below a low threshold, the system continues to reclaim memory via paging, and blocks the execution of all VMs that are above their target allocations. (Waldspurger, Section 6.3).

Neither Jeddeloh nor Waldspurger discloses causing a guest of a system to de-allocate a portion of the memory allocated to the guest in response to determining that a system parameter indicative of power consumption is greater than a specified first threshold. Waldspurger de-allocates memory from guest VMs when system free memory drops below certain thresholds. However, free memory is not a system parameter indicative of power consumption. There is no disclosure in Waldspurger that suggests de-allocating memory in response to anything having to do with power consumption. Jeddeloh discloses causing idle memory devices to enter a power saving mode when a system parameter indicative of power consumption, i.e. temperature, is less than a threshold. Accordingly, the Appellant respectfully submits that no combination of the

teachings of Jeddeloh and Waldspurger yields the invention claimed in claim 1. The Appellant respectfully requests that the Examiner's rejection of claim 1 as being unpatentable over Jeddeloh in view of Waldspurger be reversed.

Since claims 24-27 depend from claim 1, the Appellant respectfully submits that those claims are patentable over Jeddeloh in view of Waldspurger. The Appellant will argue separately the patentability of dependent claims 24, 25, and 26. Dependent claims 21, 22, 23, and 27 stand or fall with independent claim 1.

C. Dependent Claim 24 is Patentable over Jeddeloh in view of Waldspurger

Claim 24 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh in view of Waldspurger. The Examiner asserts:

> "Jeddeloh does not explicitly disclose in response to determining that said parameter is less than said specified first specified threshold, determining if said parameter is greater than a specified second threshold."
>
> "Waldspurger discloses in response to determining that said parameter is less than said specified first threshold, determining if said parameter is greater than a specified second threshold [Sections 6.1 to 6.3] to achieve predictable performances such as having a VM from which memory has been reclaimed to perform as if it had been configured with less memory (Section 3.2; Ballooning; paragraph 1)."

The Examiner is correct that Jeddeloh does not disclose the subject matter of claim 24. However, the Appellant respectfully submits that the Examiner is not correct in asserting that Waldspurger suggests modifying Jeddeloh to include in response to determining that the parameter indicative of system power consumption is less than the first threshold, determining if the parameter is greater than a second threshold. As explained above, Waldspurger discloses taking different actions to reclaim memory from VMs in response to falling below different system free memory thresholds. However, none of the thresholds of Waldspurger have anything to do with system power consumption. Jeddeloh discloses causing the memory module to enter a power reduction mode in response to low memory device usage or low memory device temperature.

The Appellant is at a loss to determine what Waldspurger suggests doing to Jeddeloh if device usage or temperature fall further below their respective thresholds. If Jeddeloh's memory device usage or temperature is too low, Jeddeloh enters the power reduction mode. If the Jeddeloh's memory module is already in the power reduction mode, why would Jeddeloh care if

the temperature dropped further? What would Jeddoloh do if the temperature did drop further? The Appellant respectfully submits that claim 24 is patentable over Jeddeloh and Waldspurger. The Appellant respectfully requests that the Examiner's rejection of claim 24 as being unpatentable over Jeddeloh in view Waldspurger be reversed.

D. Dependent Claim 25 is Patentable over Jeddeloh in view of Waldspurger

Claim 25 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh in view of Waldspurger. The Examiner asserts:

> "Jeddeloh does not explicitly disclose in response to determining that said parameter is greater than said specified second threshold, determining if said portion of system memory allocated by said guest is sufficient to handle a current load; and in response to determining that said portion of system allocated by said guest is sufficient to handle said current load, invoking said balloon code driver to request said operating system to allocate memory to said balloon code driver."
>
> "Waldspurger discloses in response to determining that said parameter is greater than said specified second threshold, determining if said portion of system memory allocated by said guest is sufficient to handle a current load [Sections 6.1 to 6.3]; and in response to determining that said portion of system memory allocated by said guest is sufficient to handle said current load, invoking said balloon code driver to request said operating system to allocate memory to said balloon code driver [Sections 6.1 to 6.3] to achieve predictable performances such as having a VM from which memory has been reclaimed to perform as if it had been configured with less memory (Section 3.2; Ballooning; paragraph 1)."

Again, the Examiner is correct that Jeddeloh does not disclose the subject matter of claim 25. However, Waldspurger does not disclose doing anything in response to determining that a system parameter indicative of system power consumption is greater than a second threshold, the second threshold being less than the first threshold. Where the system parameter indicative of power consumption is temperature, the first threshold is a temperature above which the guest operating system must allocate memory to the balloon code driver. The second threshold is a temperature less than the first threshold temperature above or below which the guest operating system may cause the balloon code driver to do something based upon system performance. In claim 25, if the parameter indicative of power consumption is above the second threshold, there is a determination if the portion of system memory allocated by the guest is sufficient to handle a current load. If so, the balloon code device driver requests an allocation of memory from the guest operating system. Waldspurger discloses using a balloon pseudo-device driver to de-allocate memory from or allocate memory to a VM guest. Waldspurger discloses using the balloon pseudo-device driver to de-allocate memory from a VM guest when certain free memory

thresholds are encountered. However, the Appellant respectfully submits Waldspurger suggests nothing claimed in claim 25. Accordingly, the Appellant respectfully submits that claim 25 is patentable over any combination of Jeddeloh and Waldspurger. The Appellant respectfully requests that the Examiner's rejection of claim 25 as being unpatentable over Jeddeloh in view Waldspurger be reversed.

E. Dependent Claim 26 is Patentable over Jeddeloh in view of Waldspurger

Claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh in view of Waldspurger. The Examiner asserts:

> "Jeddeloh does not explicitly disclose in response to determining that said parameter is greater than said specified second threshold, determining if system performance is unacceptable; if said system performance is unacceptable, invoking said balloon code driver to release memory allocated memory to said balloon code driver."
>
> "Waldspurger discloses in response to determining that said parameter is less than said specified second threshold, determining if system performance is unacceptable [Sections 6.1 to 6.3]; and if said system performance is unacceptable, invoking said balloon code driver to release memory allocated to said balloon code driver [Sections 6.1 to 6.3] to achieve predictable performances such as having a VM from which memory has been reclaimed to perform as if it had been configured with less memory (Section 3.2; Ballooning; paragraph 1)."

Waldspurger makes no determination that any parameter indicative of power consumption is less than any threshold, much less a second threshold. Waldspurger does not do anything in response to any determination that any parameter indicative of power consumption is less than any second threshold, much less determine if system performance is unacceptable. Accordingly, the Appellant respectfully submits that there is nothing in Waldspurger that suggest modifying Jeddeloh to achieve the subject matter of claim 26. The Appellant respectfully requests that the Examiner's rejection of claim 26 as being unpatentable over Jeddeloh in view Waldspurger be reversed.

III. Rawson, III '596 is not Prior Art to the Present Application

Claim 1 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rawson, III, U.S. Patent Application Publication No. 2004/0111596 (Rawson, III '596), in view of Waldspurger.

In order to be a proper reference under 35 U.S.C. §103(a), the reference must be prior art under some part of 35 U.S.C. §102. The present application was filed April 15, 2004, by

Freeman Leigh Rawson III, of Austin, Texas. The declaration filed in the present application is Exhibit A in the Evidence Appendix. Rawson, III '596 was published June 10, 2004, listing Freeman Leigh Rawson III, of Austin, Texas, as inventor. The declaration filed in Rawson III '596 is Exhibit B in the Evidence Appendix. Since Rawson, III '596 was published after the filing date of the present application, the only possible part of 35 U.S.C. §102 that could make it prior art is 35 U.S.C. §102(e), which states in pertinent part:

> "the invention was described in (1) an application for patent, published under section 122(b), *by another* filed in the United States before the invention by the applicant for patent ...."

The sole inventors of Rawson, III '596 and the present application are the same person. Accordingly, Rawson, III '596 is not *by another*, as required by 35 U.S.C. §102(e). Therefore, Rawson, III '596 is not prior art with respect to the present application. The Appellant respectfully requests that the Examiner's rejection of claim 1 as being unpatentable over Rawson, III '596 in view Waldspurger be reversed.

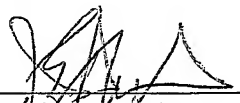
IV. Provisional Double Patenting

The Appellant notes the Examiner has provisionally rejected claims 1 and 21-27 under the doctrine of non-statutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application Serial No. 12/059,862. Since the provisional rejection is advisory in nature, the provisional rejection is not appealed. After the Board reverses the other rejections on this Appeal, the Examiner must withdraw the provisional rejection in this application.

V. Conclusion

The Applicant respectfully requests that the Board reject the Examiner's rejections in all respects.

Respectfully submitted,



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Claims Appendix

1. A method of managing power in a data processing system, comprising:

monitoring a system parameter indicative of power consumption;

responsive to determining that the parameter is greater than a specified first threshold, causing a guest of the system to de-allocate a portion of system memory allocated by the guest by causing an operating system of the system to de-allocate said portion of system memory by invoking a balloon code device driver of said operating system to request memory, wherein said balloon code device driver requests said operating system to allocate memory to said balloon code device driver; and

reclaiming by a hypervisor the portion of system memory requested by said balloon code device driver and, responsive thereto, reducing system memory power consumption.

2 – 20. (Canceled)

21. The method as claimed in claim 1, wherein said system parameter includes system temperature.

22. The method as claimed in claim 1, wherein said system parameter includes system power consumption.

23. The method as claimed in claim 1, wherein reducing system power consumption comprises powering down said portion of system memory reclaimed by said hypervisor.

24. The method as claimed in claim 1, further comprising:

in response to determining that said parameter is less than said specified first threshold, determining if said parameter is greater than a specified second threshold.

25. The method as claimed in claim 24, further comprising:

in response to determining that said parameter is greater than said specified second threshold, determining if said portion of system memory allocated by said guest is sufficient to handle a current load; and,

in response to determining that said portion of system memory allocated by said guest is sufficient to handle said current load, invoking said balloon code device driver to request said operating system to allocate memory to said balloon code device driver.

26. The method as claimed in claim 24, further comprising:

in response to determining that said parameter is less than said specified second threshold, determining if system performance is unacceptable; and,

if said system performance is unacceptable, invoking said balloon code device driver to release memory allocated to said balloon code device driver.

27. The method as claimed in claim 1, wherein reducing wherein reducing system power consumption comprises:

compacting allocated pages; and,

powering down said portion of system memory reclaimed by said hypervisor.

Evidence Appendix

Exhibit A	Declaration of Inventor Freeman Leigh Rawson III, filed in Application Serial No. 10/314,862, Publication No. 2004/0111596 (Rawson, III '596)
Exhibit B	Declaration of Inventor Freeman Leigh Rawson III filed in the present application

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **Power Conservation in Partitioned Data Processing Systems.**

the specification of which:

__X__ is attached hereto.
____ was filed on _____ as Application Serial No. _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)			Priority Claimed
N/A			Yes/No
(Number)	(Country)	(Date Filed)	
N/A			Yes/No
(Number)	(Country)	(Date Filed)	

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, 112, I acknowledge the duty to disclose information which is material to the patentability of this application as defined in Title 37, Code of Federal Regulations, 1.56, which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

N/A		
(Application Serial No.)	(Filing Date)	(Status)
N/A		
(Application Serial No.)	(Filing Date)	(Status)

EXHIBIT A - Page 1

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

John W. Henderson, Jr., Reg. No. 26,907; James H. Barksdale, Jr., Reg. No. 24,091; Thomas E. Tyson, Reg. No. 28, 543; Robert M. Carwell, Reg. No. 28,499; Jeffrey S. LaBaw, Reg. No. 31,633; Douglas H. Lefeve, Reg. No. 26,193; Casimer K. Salys, Reg. No. 28,900; David A. Mims, Jr., Reg. No. 32,708; Mark E. McBurney, Reg. No. 33,114; Volel Emile, Reg. No. 39,969; Leslie A. Van Leeuwen, Reg. No. 42,196; Christopher A. Hughes, Reg. No. 26,914; Stanley B. Green, Reg. No. 24,351; John E. Hoel, Reg. No. 26,279; Joseph C. Redmond, Jr., Reg. No. 18,753; Marilyn S. Dawkins, Reg. No. 31,140; Joseph P. Lally, Reg. No. 38,947; and Raman N. Dewan, Reg. No. 38,787.

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FULL NAME OF SOLE INVENTOR: Freeman Leigh Rawson III

INVENTOR'S SIGNATURE: Freeman Leigh Rawson III DATE: 12/9/2002
RESIDENCE: 16205 White Creek Cove, Austin, Texas 78717
CITIZENSHIP: U.S.
POST OFFICE ADDRESS: Same as above

EXHIBIT A - Page 2

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SYSTEM AND METHOD FOR RECLAIMING ALLOCATED MEMORY TO REDUCE POWER IN A DATA PROCESSING SYSTEM

the specification of which:

__X__ is attached hereto.
____ was filed on
as Application Serial No.
and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign applications(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, any foreign application for patent inventor's or plant breeder's rights certificate(s) or any PCT international application having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)			Priority Claimed
N/A			Yes/No
(Number)	(Country)	(MM/DD/YYYY)	
N/A			Yes/No
(Number)	(Country)	(MM/DD/YYYY)	

EXHIBIT B - Page 1

POWER OF ATTORNEY: As a named inventor I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

John W. Henderson, Jr., Reg. No. 26,907; Thomas E. Tyson, Reg. No. 28,543; Robert M. Carwell, Reg. No. 28,499; Jeffrey S. LaBaw, Reg. No. 31,633; Douglas H. Lefeve, Reg. No. 26,193; Casimer K. Salys, Reg. No. 28,900; David A. Mims, Jr., Reg. No. 32,708; Mark E. McBurney, Reg. No. 33,114; Leslie A. Van Leeuwen, Reg. No. 42,196; Marilyn S. Dawkins, Reg. No. 31,140; Diana L. Roberts, Reg. No. 36,654; Mark S. Walker, Reg. No. 30,699; Christopher A. Hughes, Reg. No. 26,914; John E. Hoel, Reg. No. 26,279; Joseph C. Redmond, Jr., Reg. No. 18,753; and Joseph P. Lally, Reg. No. 38,947.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF SOLE INVENTOR: Freeman Leigh Rawson III

INVENTOR'S SIGNATURE: Freeman Leigh Rawson III DATE: April 12, 2004
RESIDENCE: 16205 White Creek Cove, Austin, Texas 78717
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Related Proceedings Appendix

None